Research on Information Disclosure of Green Bonds —— Taking the EU and the United States as an Example

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Abstract: As an important part of green finance, green bonds play an important role in promoting ecological environmental protection. This paper takes the green bond information disclosure system as the research object, and the EU and the United States as the main research objects, and analyzes the existing green bond regulatory system through comparative analysis and empirical research method. The current green bond information disclosure system has problems such as insufficient legislation, insufficient regulatory measures, overlap with other environmental disclosures, and inconsistent standards, and the mandatory normative disclosure obligations for green bonds still need to be improved and further strengthened.

Keywords: Green bonds; Information disclosure, GBP

1 Introduction to Green Bonds and Information Disclosure

The concept of a green bond is often thought to have been introduced by the World Bank and the European Investment Bank in 2007.[1] In 2007, the European Investment Bank was the first to issue climate-conscious bonds. This is the first environmental bond issued by a multilateral institution. It is believed to set a precedent for green bond issuance – that is, to clarify that the funds raised will be used for green projects, and to set strict earmarking standards. [2] This was followed by the World Bank's issuance of the world's first "green bond" in 2008, raising funds specifically for climate change mitigation and adaptation projects. [3] Since then, more and more multilateral institutions, governments and businesses have participated in issuing green bonds. The main difference between green bonds and traditional bonds is that the funds raised by green bonds are only used for specific green projects, and the use of funds is tracked and monitored to ensure that the flow of funds raised is consistent with the purpose of bond issuance and has a positive environmental effect. [4]

As the variety and scale of green bond issuance continues to expand, different organizations define it differently. The World Bank defines a green bond as a fixed-income ordinary bond that provides investors with the opportunity to help mitigate and adapt to climate change by participating in green projects. [5] The Organisation for Economic Co-operation and Development (OECD) defines a green bond as a fixed-income security issued by a government, multinational bank or corporation to raise the necessary funds for projects that promote a low-carbon economy and adapt to climate change. [6] Climate Bonds Initiative – The world's most authoritative non-profit organization in the field of climate bonds and green bonds, which considers green bonds to be fixed income financial instruments that raise funds for environmental development or environmental

1 The World Bank, 'What You Need to Know About IFC's Green Bonds' (Media Release, 8 December 2021).

2 See ibid.

3 See ibid.

4 ICMA, Green Bond Principles (Industry Guidelines, June 2021) 2.

5 The World Bank, 'What You Need to Know About IFC's Green Bonds' (Media Release, 8 December 2021).

6 OECD, Green Bonds: mobilising the debt capital markets for a low-carbon transition (OECD Publishing, December 2015) 6-7.

projects. [7] Among them, the most widely agreed and rigorous definition comes from the new version of the Green Bond Principles (GBP) issued by the International Capital Market Association (ICMA) in 2021, and the Green Bond Principles (Green Bond Principles) give the most complex and strict definition: Green bonds are various types of bond instruments that earmark the raised funds or equivalent amount to provide partial/ full financing or refinancing for new and/or existing eligible green projects (see the Purpose of Raising Funds section below for details), and green bonds must have the four core elements of the Green Bond Principles: the purpose of the funds raised, the project evaluation and selection process, the management of the funds raised, and the reporting.[8] These four elements are also the characteristics that distinguish green bonds from ordinary bonds.[9]

Green bonds and climate bonds are two very similar concepts, and there are different understandings of their differences. According to some opinions, green bonds are bonds that finance investments that bring environmental benefits or reduce vulnerability to environmental change, and include climate bonds aimed at mitigating and adapting to climate change."[10] According to the Climate Bonds Initiative, a climate bond is also defined as a fixed-income ordinary bond that finances climate change mitigation and helps countries adapt to its impacts. It differs from green bonds in whether the bond issuer labels the bonds it issues as "green bonds".[11] The latter distinction is more widely accepted. This article uses the Climate Bonds Initiative's classification criteria.

The funds raised by green bonds are used for various green projects to combat climate change and environmental protection. Typical green bonds are used in large-scale, capital-intensive green construction projects because they are more likely to repay the bonds through long-term, stable, moderate cash flows. [12] According to the Green Bond Principle, potential green projects should address issues such as climate change, natural resource depletion, biodiversity conservation and pollution control. [13] Specifically, these projects include, but are not limited to: renewable energy use, energy efficiency (including energy-efficient buildings), sustainable waste disposal, sustainable land use (including sustainable forestry and agriculture), biodiversity conservation, clean transportation, sustainable water management (including clean water and drinking water treatment), climate change adaptation. [14] A green bond is a thematic bond, which is a specialized bond issued to achieve a specific purpose. [15] Similar bonds include U.S. 19th-century railroad bonds, [16] 20th-century war bonds,[17] and 1960s highway bonds, and green bonds' purpose-oriented and innovative approach to

7 Climate Bonds Initiative, Green Bond Labels and Standards (CBI Webinar, June 2016) < https://www.climatebonds.net/files/files/Green%20 Bond%20Labels%20and%20Standards%2010-06-2016.pdf > 3.

8 ICMA, Green Bond Principles (Industry Guidelines, June 2021) 2.

9 See ibid.

10 Troy Segal, ‘Green Bond: Types, How to Buy, and FAQs’ (Web Page, 21 September 2022) < https://www.investopedia.com/terms/g/green-bond. asp#:~:text=Climate%20bonds%20specifically%20finance%20projects,with%20a%20positive%20environmental%20impact.>.

11 Climate Bonds Initiative, Green Bond Labels and Standards (CBI Webinar, June 2016) < https://www.climatebonds.net/files/files/Green%20 Bond%20Labels%20and%20Standards%2010-06-2016.pdf > 3,7,9.

12 OECD, Green Bonds: mobilising the debt capital markets for a low-carbon transition (OECD Publishing, December 2015) 8-9.

13 ICMA, Green Bond Principles (Industry Guidelines, June 2021) 4.

14 See ibid.

15 United Nations Development Programme, Thematic Bond 101: Macro Environment, Market Dynamics and Steps to Issuance (Framework released by UNDP).

16 Floyd W. Mundy, ‘Railroad Bonds as an Investment Security’ (1907) 30 The Annals of the American Academy of Political and Social Science 312.

17 Andrew Ancheta, ‘War Bond’ (Web Page, 27 March 2022) <http://www.investopedia.com/ter/ w/warbonds.asp>.

economic, environmental, and social benefits has inspired new types of bonds, such as forest bonds, rainforest bonds, carbon bonds, and clean energy bonds.[18] These bonds, along with earlier climate-conscious bonds, are collectively known as climate bonds.

Although the types of green bonds vary, regulators have basic rules for their disclosure. Because it is a system at the heart of the bond market, it is related to the good functioning of the entire market. Information disclosure refers to the disclosure of information that the information is advantageous, and the information is disclosed to the weaker party, which the former has, and the latter does not. The purpose of information disclosure is to maximize the disclosure of material information about the issuer and stakeholders to investors for investment or hedging decisions.[19] The general requirement of the interbank bond market is that all material information affecting the solvency of enterprises should be disclosed by enterprises and relevant parties.[20] Securities regulators focus on the information disclosure of listed companies, stipulating that major events that have a greater impact on the trading price of listed companies' shares should be disclosed. In general, the information disclosure of green bonds includes not only the above-mentioned information that affects the solvency and price of bonds, but also the disclosure of green information, such as environmental benefits, use of funds, green projects, and other information.

2 Significance Analysis and Theoretical Basis of Green Bond Information Disclosure System

2.1 Significance of information disclosure

Compared with ordinary bonds, the integrity and authenticity of the information disclosure content, the convenience of information acquisition, and the frequency of information disclosure affect the public's acceptance and participation in the information disclosure of green bonds, which shows that information disclosure is very important to the development of the green bond market.[21] The significance of this system is mainly reflected in optimizing resource allocation, promoting market restraint and enhancing investor protection.[22]

First, for issuers, the system can restrict the behavior of green bond issuers to the greatest extent, prevent the occurrence of "greenwashing", and at the same time improve their ability to operate and manage green projects and promote issuers to improve internal governance.[23] Second, from a regulatory point of view, the green bond information disclosure system is conducive to the combination of internal supervision and external supervision, and regulatory authorities, self-regulatory organizations and market participants can play a supervisory role to jointly create a relatively fair market environment.[24] Third, from the perspective of investors, the green bond information disclosure system is the core of protecting the interests of investors and is conducive to achieving the optimal allocation of resources.[25] Fourth, from the perspective of market risk, the green bond information disclosure system helps to timely discover whether green issuers have financial or operational problems and prevent the occurrence of market systemic risks.[26]

2.2 Asymmetric information theory

Asymmetric Information Theory is one of the

[18] Climate Bonds Initiative, 'UNDRR and Climate Bonds begin an ambitious journey into climate resilience finance' (Media Release, 20 June 2023).

[19] California Green Bond Market Development Committee, Recommended Approach to Municipal Green Bond Disclosure (Guidance paper, May 2023) 4.

[20] See ibid.

[21] See ibid.

[22] See ibid.

[23] Jochen M. Schmittmann, Yun Gao, 'Green Bond Pricing and Greenwashing under Asymmetric Information'2022 2022(246) IMF Working Papers 40-42.

[24] ICMA, Green Bond Principles (Industry Guidelines, June 2021) 6.

[25] Jochen M. Schmittmann, Yun Gao, 'Green Bond Pricing and Greenwashing under Asymmetric Information'2022 2022(246) IMF Working Papers 40-42.

[26] ICMA, Response to the ESMA's Guidelines on funds' names using ESG or sustainability-related terms (Voluntary Process Guidelines, 20 February 2023) 2-4.

theoretical cornerstones of economics and a pillar of the theoretical system of the securities market. It was proposed by American economists such as Joseph Eugene Stiglitz to mean that in the context of a market economy, buyers and sellers cannot completely possess each other's information, and this asymmetric situation must lead to the information advantage to the harm of the other party for personal gain.[27] The objective reason for this is the refinement of the social and professional division of labor, so that people only understand a small range of knowledge in their own field, and their understanding of investment products is only superficial, and there is information asymmetry compared with issuers.[28] The subjective reason is that different market entities have different ability to obtain and analyze information, and it takes a certain cost to obtain information. Green bond issuers have more important information than investors, and they are more likely to use it for personal gain, resulting in green investors being exploited.[29]

In addition to the market failure caused by information asymmetry, the public choice theory of economics holds that the information disclosed by the financial market is a kind of public goods, and the financial reports and other information released by disclosure entities such as listed companies are not the resources enjoyed by the issuer and investors alone, and there are many other "free riders" of information, and the disclosure entity cannot require them to pay the cost of information.[30] This leads to a lack of motivation for disclosure entities to provide more information and fail to achieve Pareto Optimum.[31] And in the green bond market, the consequences of investors being exploited by information asymmetry are manifested as the issuer's misrepresentation of green project information, that is, greenwashing, which only falsely claims to be related to environmental protection and green development, which ultimately leads to a negative premium for green bonds and damages the healthy development of the green bond market.[32] The information with the attributes of public goods makes the disclosure entity insufficient motivation to publish, and the intervention of the regulatory authorities is required.

2.3 Green finance theory

Since the 90s of the 20th century, environmental factors have gradually been taken into account in finance.[33] For a long time, it was customary to assume that the direct impact of the financial system on the environment was minimal, and that the indirect impact of the financial system as a key link in the flow of money was not carefully assessed. The first article to introduce the idea of environmental finance was written by Mark White in 1996. He emphasized how, on the one hand, the trend of financial globalization has accelerated the exploitation and looting of natural resources by human activities, and on the other, financial resources have sought out more lucrative and effective investment opportunities globally, increasing the overall welfare of both humans and nature.[34] Once more explicitly referring to the idea of environmental finance in 1998, Jose Salazar argued that the financial system should take into account and incorporate environmental needs into its own financial operations. Since then, concerns about environmental finance have drawn more and more attention.[35]

27 The Nobel Prize, ‘Popular Information’ (Media Release, 2001).

28 See ibid.

29 See ibid.

30 Robert Longley, ‘What is Public Choice Theory?’ (Media Release, 27 October 2022).

31 See ibid.

32 Jochen M. Schmittmann, Yun Gao, ‘Green Bond Pricing and Greenwashing under Asymmetric Information’2022 2022(246) IMF Working Papers 40-42.

33 Hu Tao, Shan Zhuang, ‘Technological Forecasting and Social Change’ (2022) 179 (6) Technological.

34 Ibid 6-8.

35 See ibid.

2.4 Structural functionalism theory

Structural functionalism is a theory that focuses on the functional analysis of the institutional structure of the social system. This theory was formed after the Second World War. Scholars such as Parsons and Merton in the United States are the main representatives of this theory. The theory is that social life is sustained because society finds a means (structure) to meet human needs.[36] At the level of legal research, Luhmann's systematic jurisprudence was influenced to a certain extent by Parsons and others, who also held similar views in their interpretation of the legal system. Luhmann's research mainly focuses on the discussion of the relationship between the complexity and coupling of the real world and the legal system.[37] Therefore, he believes that the relationship between the legal system and the external environment is extremely complex and inseparable, that is to say, the social environment will have a major impact on the evolution of the legal system.[38] It can be seen that this theory has its unique explanatory ability when analyzing the institutional system formed by the interweaving of self-regulatory rules such as green bonds, public policies, laws and regulations, especially from the analysis of the correlation between the institutional system and the practice environment.[39] From the practical factors to the evolution and development of the system, the use of this theory can provide a comprehensive answer to the solution of the problem from a relatively macro perspective, and it is conducive to overcoming the rigidity risks in the traditional legal system.

Therefore, the relevant research on the green bond legal system has the characteristics of strong cross-field law, which reflects the legal system's attempt to actively resolve emerging social problems, and also reflects the difference between "precision" and "emergency" legal research. There is a lack of dynamic interaction between transformation and feedback, which is the key to distinguishing it from traditional normative elements and functional elements in field legislation and using this to guide the overall optimization of the institutional system. Based on the perspective of structure and function, the green bond legal system as an interdisciplinary field includes the task of interaction between public law and private law. Specifically, it is necessary to strengthen the interactive logic of absorption or promotion in its practice to promote the systematization of the green bond legal system.

In short, in the process of constructing and improving the green bond legal system, it is necessary to consider the structural functions of relevant systems as a whole, in order to effectively respond to the actual needs of green economic development. The issuance, custody, trading and settlement of green bonds involves the simultaneous application of rules of private law and rules of public law. However, these regulations are currently scattered, and each jurisdiction has both commonly respected principles and standards and special ones. Legislation, if there is no relevant logic and theoretical support to sort it out systematically, it will be difficult to grasp the status quo of the green bond legal system as a whole, and it is difficult to propose optimization plans to promote the development of the green bond legal system. Therefore, from the perspective of development needs and under the logic of the decentralized legislative model, flexible clauses can be set in the low-carbon development of the Environmental Code, in order to provide effective soft constraints for the development of green bonds.

3 Current Regulatory Regimes in the United States and the European Union

3.1 International standard: soft law provisions

At present, there are two sets of relatively compre-hensive and reliable green bond standards that are the

[36] Britannica, 'structural functionalism' (Web Page, 25 April 2023) <https://www.britannica.com/topic/structural-functionalism.>

[37] Cordero, R, 'The Negative Dialectics of Law: Luhmann and the Sociology of Juridical Concepts' Social and Legal Studies (2020) 29(1) 5.

[38] Ibid 8.

[39] See ibid.

most widely accepted in the world, of which the rules for green bond information disclosure are mainly reflected in these two sets of green bond standards. One is the Climate Bond Standards (CBS) published by the CBI,[40] and the other is the GBP issued by ICMA.[41] Both sets of standards emphasize the effectiveness and transparency of information disclosure, marking information disclosure as a core element in the green standard, with the goal of promoting the effective disclosure of important information so that more green projects can be allocated accordingly. Its rules regarding information disclosure are shown in Figure 1 :

The difference between CBS and GBP is mainly that CBS targets green bonds with a focus on low-carbon projects, while GBP applies to a wider range of projects.[42] CBS contains a broader list of low-carbon project types, including 46 project type sectors that can be financed with green bond revenues. CBS includes pre-issuance requirements and post-issuance requirements for a classified list of items for which proceeds can be used, sets out mandatory procedures for tracking the use of proceeds, requires bond issuers to publish annual reports on the use of proceeds and recommends that bonds be approved by external validators to check whether the relevant green bonds meet standardized standards. Once a qualified project is identified, CBS requires the issuer to obtain third-party verification from validators who have already been approved by the CBS Commission.[43]

Standard	Disclosure object	Disclosure frequency	Disclosure content
GBP	Market participants	Renewed every year until all funds are fully invested. Timely update on major matters	Green project list, project description, fund allocation, idle capital investment, expected results (qualitative and quantitative indicators are required as much as possible)
CBS	Bondholders and the CBS Secretariat	At least every annual periodic report	List of designated projects and assets to be invested or reinvested, brief description of project content, allocation of funds, idle funds, related information, information on expected environmental benefit targets, expected environmental benefit objectives (use quantitative performance indicators as much as possible).

Figure 1 Summary of information disclosure rules for GBP and CBS

From the above table, we can see that both GBP and CBS require green bond information disclosure to be carried out at least every year, and their disclosure objects are slightly different, CBS requires that in addition to the disclosure of information to bondholders, it is also necessary to disclose to the climate bond standard secretariat formed by the Climate Bond Initiative, and the provisions on disclosure content are similar, covering project lists and descriptions, fund allocation, environmental benefit targets, etc., while encouraging the use of quantitative indicators to analyze environmental benefit targets. However, the assumptions and methodology used need to be clarified. The goal is to facilitate market participants' full understanding of green bonds.

3.2 EU regulations on disclosure of green bonds

Europe is the origin of green bonds, and from a practical point of view, the World Bank and Sweden's Nordic Sian Bank jointly issued the first clearly marked green bond in 2008, which marked the official beginning of global green bond practice.[44] Since then, Europe has continued to make significant achievements in green bond innovation, including Poland's issuance of the world's first green sovereign bond in 2016.[45]

40 Climate Bond Certified, Climate Bonds Standard (Guidance Paper, April 2023).

41 ICMA, Green Bond Principles (Industry Guidelines, June 2021).

42 Climate Bond Certified, Climate Bonds Standard (Guidance Paper, April 2023) 3.

43 Scott Breen and Catherine Campbell, 'Legal Considerations for A Skyrocketing Green Bond Market' (2017) 31(1) Natural Resources & Environment 16,18.

44 The World Bank, ‘What You Need to Know About IFC’s Green Bonds’ (Media Release, 8 December 2021).

45 Ibid.

ECB statistics also show that the EU issued 46% of global green bonds in 2022, with a total size of about $228.6 billion, with Germany issuing the largest number of green bonds, reaching more than $61 billion.[46] It can be seen that the practice of Europe, especially the EU and its member states, is an important part of the green bond regulatory system that cannot be ignored. At the same time, Europe attaches great importance to the use of fiscal instruments to provide positive incentives in promoting ecological environmental protection. For example, it attaches more importance to the use of policy financial instruments such as structural funds, environmental protection funds, and the European Investment Bank in governance activities, and the above measures have also made important contributions to the continuous improvement of the quality of the European ecological environment.[47] The maturity of green bonds also requires the active intervention of fiscal means, which is an important presentation of the policy characteristics of green bonds and the commonality of the global green bond legal system.

Following the signing of the Paris Agreement on December 12, 2015, the European Commission established the High-Level Expert Group on Sustainable Finance at the end of 2016, and the European Commission's Technical Expert Group developed two systems in 2019: the EU Sustainable Finance Classification Scheme and the EU Green Bond Standard.[48] Clear requirements are set out for EU member states to issue green bonds for financing and refinancing. Among them, the EU Green Bond Standard stipulates in detail the use, identification and income of green bonds within the EU, and these systems provide basic institutional guarantees for the development of the green bond market of member states from the EU level. On February 28, 2023, the European Council and the European Parliament announced that they had reached an interim agreement on the creation of a European Green Bond (EuGB), which could enter into force in 2024.[49]

In its January 2018 report, the High-Level Panel on Sustainable Finance pointed out that the EU needs to reform existing green finance disclosure rules, in a way that recognizes the importance of green bond disclosure for both companies and financial institutions.[50] At the company level, disclosure of long-term sustainability activities and indicators is a very powerful tool to facilitate internal discussions, improve governance, and enhance dialogue between boards and stakeholders. Similarly, financial institutions must disclose information to ensure that the sustainability preferences of their beneficiaries are taken into account.[51] There are three ideas worth examining:

First, long-term investment decisions need to fully disclose long-term sustainability risks and opportunities. Current disclosure rules focus on the short term, making it difficult to assess long-term information on green bonds. For example, the models used by financial analysts rarely capture the development of green bonds over one to three years. Moreover, most disclosures rely on qualitative rather than quantitative factors.[52]

Second, fully attach importance to and learn from the two existing green finance information disclosure rules.[53] The first is a disclosure rule at the international level, namely the Climate-related Financial Disclosure

[46] See https://www.climatebonds.net/market/data/.

[47] See ibid.

[48] European Commission, European green bond standard (Media Release, 11 December 2019).

[49] European Commission, Sustainable Finance: Commission welcomes political agreement on European bond standard (Media Release, 28 February 2023).

[50] Committee on Economic and Monetary Affairs, REPORT on Sustainable finance 4.5.2018 - (2018/2007(INI)).

[51] See ibid.

[52] See ibid

[53] See ibid

Rules developed by the Financial Stability Board Task Force, which is the first to have the potential to become the dominant framework for climate-related financial disclosures.[54] The second is a national-level disclosure rule, namely Article 173 of France's Energy and Green Growth Act[55], which requires mandatory environmental reporting for institutional investors, including asset managers, insurance companies, pension funds and social security funds. Based on the "comply or explain" approach, Article 173 has proven to be a powerful tool for incorporating disclosure rules into financial institutions.[56]

Finally, at the international level, the EU is committed to using its international leadership to work with regulators in key partner countries to progressively raise the standard of disclosure of global green finance information.[57] It believes that green investors around the world deserve better information on how large international companies, in particular, align with global sustainability goals.[58]

In the securities-regulated market, in April 2021, the European Commission published a proposal for the Corporate Sustainability Reporting Directive (CSRD).[59] The purpose of CSRD issuance is to replace NFRD as a more comprehensive, rigorous, and unified ESG information disclosure specification.[60] The proposal comprehensively upgrades and reforms NFRD in terms of the concept, scope, format, standards, and assurance of ESG disclosure, as shown in Figure 2.

3.3 U.S. regulations on green bond disclosure

The United States is the first country in the world to pay attention to and formulate an environmental information disclosure system. In 1934, the U.S. Securities and Exchange Commission (SEC) passed Regulation S-K of the Securities Act, which required public companies to disclose environmental liabilities, costs of complying with environmental regulations, and other non-financial information.[61] In order to promote the federal government to actively address climate change, the National Environmental Policy Act was passed by the U.S. Congress in 1969, which as the first international environmental basic law, also prompted the SEC to include non-financial information such as environmental protection in the scope of issuers' disclosures.[62]

In addition to complying with the disclosure requirements of ordinary bonds, the US Securities and Exchange Commission (SEC) encourages issuers to

	NFRD	CSRD
Idea	Social responsibility	sustainable development
Scope of application	Large companies with more than 500 employees, involving about 11,700 companies	All large enterprises and public companies, small and medium-sized listed companies can have a three-year transition period, involving about 50,000 companies
Framework standards	follow any available framework standard	Reporting in accordance with mandatory EU harmonized sustainability reporting standards
Reporting form	Information is reported in the Annual Report, but individual Member States may publish it as a separate document	All information must be included in the management report. Introduce more detailed reporting requirements, with reported information digitized and machine-readable
Whether it is certified	No assurance of ESG reports	Limited and reasonable assurance of reported information

Figure 2 Comparison of NFRD and CSRD

54 See ibid.

55 The Energy Transition for Green Growth Act (LTECV 2015, France).

56 Ibid, Article 173.

57 European Commission, Sustainable Finance: Commission welcomes political agreement on European bond standard (Media Release, 28 February 2023).

58 See ibid.

59 European Commission, Corporate Sustainability Reporting (Guidance Paper, 21 April 2021).

60 See ibid.

61 Securities and Exchange Commission, 'Regulation S-K' (Code of Federal Regulations, Title 17, Chapter II, 1934) s 101, 103, 303

62 'National Environmental Policy Act of 1969' (Public Law 91-190, 1 January 1970).

adopt the GBP disclosure standard template, which will eventually be included in the filing. In 2010, this requirement was further increased when the SEC issued the Committee's Guidance on Climate-Related Disclosures, accompanied by the Guidance on Disclosure of Information Related to Climate Change,[63] which states that the points to be disclosed may include: (1) the impact of climate change-related legislation; (2) the impact of relevant international agreements on climate change; (3) supply chain disruptions caused by climate change; (4) the consequences of government regulation or business trends; (5) Physical impacts of climate change.[64] It can be said that the Guidelines have opened a new era for US-listed companies to disclose environmental information such as climate change.

In terms of ESG reporting disclosure guidelines, the NASDAQ Exchange issued ESG Reporting Guidelines 1.0 and ESG Reporting Guidelines 2.0 in 2017 and 2019 respectively.[65] The ESG Reporting Guide 2.0 lists ten indicators for environmental, social and corporate governance, and provides detailed disclosure guidelines for each indicator.[66]

The SEC regulates the securities market in a unified manner, establishing a bond market disclosure system, supervising and punishing violations, and supervising the conduct of intermediaries and related self-regulatory organizations. As a kind of debt securities, the supervision of green bonds also belongs to the scope of the bond supervision system. There are three main laws governing the disclosure of bonds in the United States: the Securities Act of 1933 and the Securities Exchange Act of 1934 provide for pre- and post-issuance information disclosure, respectively;[67] The Sarbanes-Oxley Act, promulgated in 2002, regulates the disclosure of information on significant matters.[68] These laws are designed to provide investors in securities with adequate information while assessing the ability of bond issuers to meet their obligations.[69]

For green bonds, the United States has great respect for the application of soft law standards in green bond disclosures. When green bonds are offered publicly, the issuer must register an offer with the SEC, which has different application forms for different bond types. Issuers registering debt securities with the Securities and Exchange Commission must include a description of the issuer's business, an explanation of the use of proceeds, and certain financial information certified by independent accountants, in addition to complying with the general bond information disclosure requirements, green bond issuers will generally adopt the GBP's disclosure requirements to explain the purpose of the raised funds, management, green projects invested, environmental benefits, etc., and undertake to disclose relevant information during the duration of the existence.[70]

Some companies ostensibly claim to support environmental protection, but in fact, do not make any environmental protection actions, just create a false environmental image, and even whitewash some illegal activities such as pollution in order to increase profits, which is usually identified as "greenwashing". The term is often used in the green bond market to indicate that the bond is incorrectly labeled green or exaggerates the environmental benefits of green projects.[71] Greenwashing

[63] Securities and Exchange Commission, 'Commission Guidance Regarding Disclosure Related to Climate Change' (Release Nos. 33-9106, 34-61469, FR-82, 8 February 2010).

[64] Ibid.

[65] NASDAQ, 'ESG Reporting Guide 1.0' (2017). NASDAQ, 'ESG Reporting Guide 2.0' (2019).

[66] Ibid

[67] Securities Act of 1933' (Public Law 73-22, 27 May 1933).'Securities Exchange Act of 1934' (Public Law 73-291, 6 June 1934).

[68] Sarbanes-Oxley Act of 2002' (Public Law 107-204, 30 July 2002).

[69] Thomas Lee Hazen, The Law of Securities Regulation (West, 2009) 98.

[70] Wang, 'Financing Green: Reforming Green Bond Regulation in the United States' (2017) 12(1) Brooklyn Journal of Corporate, Financial & Commercial Law 467.

[71] Van Renssen, 'Investors Take Charge of Climate Policy' (2014) 4(4) Nature Climate Change 241.

is possible as the U.S. currently adopts a voluntary disclosure of green bond information by issuers in accordance with ICMA's Green Bond Principles and CBI's Climate Bond Standards.

If an issuer is suspected of greenwashing, the SEC will investigate, adjudicate and punish it in accordance with anti-fraud provisions or other disclosure requirements. In terms of administrative penalties, the SEC adopted measures such as prohibiting the green bond from continuing to trade, prohibiting the issuer from entering the securities market, imposing disciplinary sanctions on relevant institutions and practitioners, and imposing fines. Criminally, if an issuer is suspected of committing a crime, such as misrepresenting material information, the SEC will refer the case to the Department of Justice, which can be sentenced to up to 10 years in prison under the Securities Exchange Act of 1934.[72] Financial statement irregularities are mainly contained in the Sarbanes-Oxley Act, and those responsible for financial statement irregularities are punished with up to 25 years in prison for fraud, with fines of up to $25 million for companies and up to $5 million for individuals.[73] In civil terms, in addition to the SEC may apply to the court as a plaintiff to pursue the civil legal liability of the issuer, the victim's class action is a relatively common form, and the arrangement of the lawyer's high remuneration system is the real driving force of class action. Due to the decentralized nature of investors in the capital market, the class action system plays a pivotal role in the prosperity and development of the securities market.

4 Shortcomings and Suggestions of the Existing System

4.1 Lack of mandatory legal norms and responses

Soft law plays an important role in green bond disclosure, and although soft law lacks legal binding force in a narrow sense, it can actually allow actors to comply voluntarily and universally. There are sufficient reasons for this effectiveness, such as experience from more developed financial markets or the fact that soft law founders have considerable expertise and persuasiveness, and advanced international experience is often more acceptable; Competing objectives, such as attracting international investment, also incentivize regulators to absorb and translate such soft laws; In many cases, "soft law" norms have become intertwined with traditional law-based government regulation over time,[74] more typically with the SEC recommending the use of GBP standards for green bonds and providing templates.

As the French scholar Francis Snyder put it, "soft law is a rule of conduct that is not legally binding in principle but has practical effect”.[75] There are also some problems with soft law in terms of the disclosure mechanism of the green bond market, which is manifested in whether it can safeguard the interests of more stakeholders; and the gap between it and laws and regulations in terms of authority and standardization.

As a general rule, soft law governance standards do not have the same enforcement mechanisms as public regulation and lack state coercion. Soft law governance standards generally do not have the same enforcement mechanisms and cannot rely on national enforcement of laws.[76] Under a governance system that relies purely on soft law, the consequences of violating such licensing rules are entirely determined and responded to by the market, such as through peer pressure, reputational costs and other market mechanisms to form rules. However, more strictly enforced rules, as well as mechanisms to monitor and enforce compliance, such as external audits, disclosure of violations to the public, legal consequences, and sanctions for violations of normative rules by referring to the design

72 Securities Exchange Act of 1934' (Public Law 73-291, 6 June 1934).

73 ‘Sarbanes-Oxley Act of 2002' (Public Law 107-204, 30 July 2002).

74 That’s the reason why ICMA and other Industry Association released these guidance paper.

75 Snyder F, ‘Soft Law and Institutional Practice in the European Community M (1994) 198 Springer Netherlands 132.

76 Ibid 134.

of administrative enforcement mechanisms.[77]

Therefore, it is necessary to combine the securities disclosure system with the soft law of green bonds in future legislative development, unify the normative standards, clarify the unified supervision authority and legal consequences, so as to prevent greenwashing, protect the interests of investors, and strengthen the supervision of green bond disclosure.

4.2 Inconsistencies in standards and responses

GBP as the most influential green bond rules, but the problem with the "green" recognition standards is the lack of strict prescriptiveness, in the GBP there are nine categories of green bond classification, of which only a few categories such as renewable energy, greenhouse gas emission control and so on are added for reference, it is a market participant-led loose rule, expanding the green bond market is its top priority, stakeholders are passive beneficiaries of this standard. In theory, green bonds are green if the proceeds are used to finance environmental projects such as clean energy and clean transportation.[78]However, in fact, due to the ICMA's own structural problems and the lack of external binding regulatory regulations, there is a lack of strict standards and certain opaque in the identification of green standards.

The GBP is led by an Executive Committee that has broad authority to interpret and develop the process and content of the GBP. The Executive Committee is composed entirely of institutional investors, issuers and underwriters from each country. Other stakeholders, such as NGOs, auditors, consultants and service providers, can participate as non-voting observers.[79] The International Capital Market Association (ICMA) as the secretariat is the trade association of global capital markets market participants. This centralized structure fosters the collaboration of interests among like-minded companies and may be more effective in incentivizing the adoption of CSR standards than public regulation. However, this closed-door approach may prevent stakeholders from directly participating in the development and implementation of regulations, making the decision-making process less transparent.

In a case in point, in 2015, the Massachusetts State College Building Authority sold green bonds to fund a 725-space parking lot near the university.[80] The college advertises that the garage has reserved space for carpoolers and electric vehicle charging stations, and further states that the garage will limit the number of students circling campus in search of parking, thereby reducing pollution. However, the ensuing debate is whether the garage would be harmful to the environment since it would encourage students to drive.[81] In addition, due to the inconsistency of international standards and respective policy considerations, there is another typical example of China. China allows clean coal projects to be labeled as green bonds and advertises that clean coal is 70 percent cleaner than conventional coal. However, clean coal is not considered green by international standards.[82]

The regulatory system necessary for the proper functioning of the market can only be provided and guaranteed externally. In addition to the government, in a certain sense, it is the self-organization of society without institutional systems, especially the intermediary organization of self-discipline and autonomy. Self-regulatory organizations in the financial industry are at the forefront of the market, not only have the advantages of professionalism and flexibility, but the standards of self-

[77] See ibid.

[78] ICMA, Green Bond Principles (Industry Guidelines, June 2021) 5-7.

[79] Nordic Investment Bank, Green Bond Principles: NIB a candidate for Executive Committee (Media Release, 6 June 2016).

[80] Megan Darby, ‘Green bond to fund multi-storey car park’ (Media Release, 13 January 2015).

[81] See ibid.

[82] Wenying Chen, ‘Clean coal technology development in China’(2010) Energy Policy 38 (5) 2123.

regulatory rules are often higher than legal norms. But ambiguity in standards and opaque decision-making raises questions about the legitimacy of "soft law" regulatory norms.

Soft-law regulatory norms can easily lead some interest groups to use representative democracy to influence regulators through both technical and political dimensions. In the soft-law governance mechanisms that shape the disclosure rules for green asset securitization, the potential for this regulatory capture has increased. Industry-led private governance sets rules based on narrower economic interests. As a result, soft-law governance mechanisms are inherently vulnerable to pressure from interest groups, and there is a lack of public accountability mechanisms to identify, mitigate and disclose these pressures.

Another problem brought about by the ambiguity of standards is that it seriously affects the transparency of the information disclosure system. In the absence of uniform "green" eligibility criteria in the regulatory system, the environmental benefits of green bond projects are questionable. Some criteria may include nuclear power related to clean coal technologies, while others will not include such projects. These conflicting criteria pose questions about the growth and effectiveness of green bonds as a tool to finance climate mitigation and adaptation. For example, in 2017, Spanish oil and gas company Repsol issued certified green bonds to fund plants to reduce emissions and improve production efficiency.[83] It may have reduced emissions by some units, but it reinforced the fossil fuel industry's viability and risks for further growth. In 2014, GDF Suez (now French multinational power company Engie) issued certified green bonds to finance the Giro Dam in Brazil. But the dam construction led to historic flooding along the river, forcing thousands of people from their homes.[84] By not properly consulting indigenous peoples, indigenous peoples are in danger of losing their land, while also having the ecological impact of extinction of many fish species.[85]

The lack of uniform standards, the lack of a rationale for accountability in all forms of external verification bodies, and divergent eligibility criteria for qualified environmentally sustainable projects hinder investors' ability to identify, trust and compare. Therefore, countries should promote the process of standardizing green bonds through legislation or by international organizations in the form of international law, which refers to the act of formulating common and repeated terms for actual or potential problems in order to obtain the best order within a certain range, including the process of developing, publishing and implementing standards.

In summary, the current green bond market operates largely on criteria and practices defined by market players, allowing companies to act as external verifiers to provide assurances to investors, existing standards that develop process-based guidelines or recommendations, but are not standardized, rigorous and comprehensive enough to allow investors to easily identify whether returns are consistent with or contribute to environmental goals, and limit issuers' ability to use environmentally sustainable bonds to transition their economic activities to a greener model.

5 Conclusion

The green bond market offers multiple benefits for environmental protection by providing a source of green financing. As the green bond market expands, investors will expect more regulation and transparency, and the market standards currently in use do not adequately ensure the transparency and legal accountability of green bonds, nor do they have ongoing oversight of external verification agencies. The governance of green bond markets must go beyond industry-driven self-regulation and require

[83] See ibid.

[84] ICMA, Green Bond Principles (Industry Guidelines, June 2021) 5-7.

[85] Nordic Investment Bank, Green Bond Principles: NIB a candidate for Executive Committee (Media Release, 6 June 2016).

a dominant substantive standard to be responsive to the needs of investors and capital markets.

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